CLAIMS

I claim:

Sub A4

1. An active standby system for a control system, the active standby system comprising:

a first and a second controller, each controller having an operating state;

an IO module;

a network connector; and,

a high speed fiber optic network cable for operably connecting the first controller, the second controller and the IO module, wherein a signal is transmitted over the high speed fiber optic network cable at a rate of at least 100 Mb/s.

2. The active standby system of claim 1 wherein each controller comprises:

a processor;

a co-processor;

an operating system executed by the processor; and,

a co-operating system executed by the co-processor wherein the operating system and the co-operating system cooperate to transfer data between the first controller, the second controller and the IO module.

3. The active standby system of claim 2 wherein the operating system is embedded in the processor.

4. The active standby system of claim 1, wherein each controller further comprises a network identifier and the network identifier of each controller is selected in response to the operating state of its respective controller.

5. The active standby system of claim 4 wherein the network identifier is an Internet Protocol address.

6. The active standby system of claim 4 wherein the network address identifier is a Media Access Control address.

7. The active standby system of claim 1 wherein the network connector is a hub for controlling signal communication over the fiber optic network.

8. The active standby system of claim 7 further comprising a master-slave type application layer protocol to ensure that only one signal is being transmitted at a time.

9. The active standby system of claim 1 wherein the network connector is a switch for controlling signal communication over the fiber optic network cable to avoid signal collisions and maintain determinism throughout the fiber optic network.

10. A method of providing an active standby control system comprising the steps of:

providing a first and a second controller, each controller having an operating state;

providing an IO module; and,

operably connecting the first controller, the second controller and the IO module through a connector and a fiber optic cable, the operably connected first controller, the second controller, the IO module, the fiber optic cable and the connector forming a sub-network; wherein data is transferred throughout the sub-network at a rate of at least 100 Mb/s.

11. The method of providing an active standby control system of claim 10 further comprising controlling the transmission of the signal on the sub-network.

12. The method of providing an active standby control system of claim 11 wherein the step of controlling signal communication on the sub-network comprises a hub.

13. The method of providing an active standby control system of claim 12 further comprising using a master-slave type application layer protocol to ensure that only one signal is being transmitted at a time.

14. The method of providing an active standby control system of claim 10 wherein the step of controlling signal communication on the sub-network comprises a switch for controlling signal communication over the fiber optic network cable to avoid signal collisions and maintain determinism on the sub-network.

~~15.~~ A method of providing an active standby control system comprising the steps of:

providing a first and a second controller, each controller having an operating state;

providing an IO module;

operably connecting the first controller, the second controller, the IO module and a network connector with a fiber optic cable and forming a sub-network wherein data is transferred throughout the sub-network at a rate of at least 100 Mb/s;

controlling signal communication over the fiber optic sub-network;

assigning a network identifier to each controller;

placing one controller in primary mode and the other controller in secondary mode;

sensing the operating state of each controller, wherein the network identifier of each controller is selected in response to the operating state of each respective controller;

exchanging the network identifiers between the first and second controllers; and,

transmitting a reverse address resolution protocol (RARP) message.

16. The method of claim 15 wherein each controller comprises:

a processor;

a co-processor;

an operating system executed by the processor; and,

a co-operating system executed by the co-processor wherein the operating system and the co-operating system cooperate to transmit data throughout the sub-network.

17. The method of claim 15 wherein the co-processor is embedded within the processor.

18. The method of claim 15 wherein the operating system is embedded.

19. The method of claim 15 wherein the sub-network is an Ethernet network.

20. The method of claim 15 wherein the network identifier is an Internet Protocol address.

21. The method of claim 15 wherein the network identifier is a

Media Access Control address.

22. The method of claim 15 wherein the network connector is a hub for controlling signal communication over the fiber optic network.

23. The method of claim 15 further comprising a master-slave type application layer protocol to ensure that only one signal is being transmitted at a time.

24. The method of claim 15 wherein the network connector is a switch for controlling signal communication over the fiber optic network cable to avoid signal collisions and maintain determinism throughout the fiber optic network.